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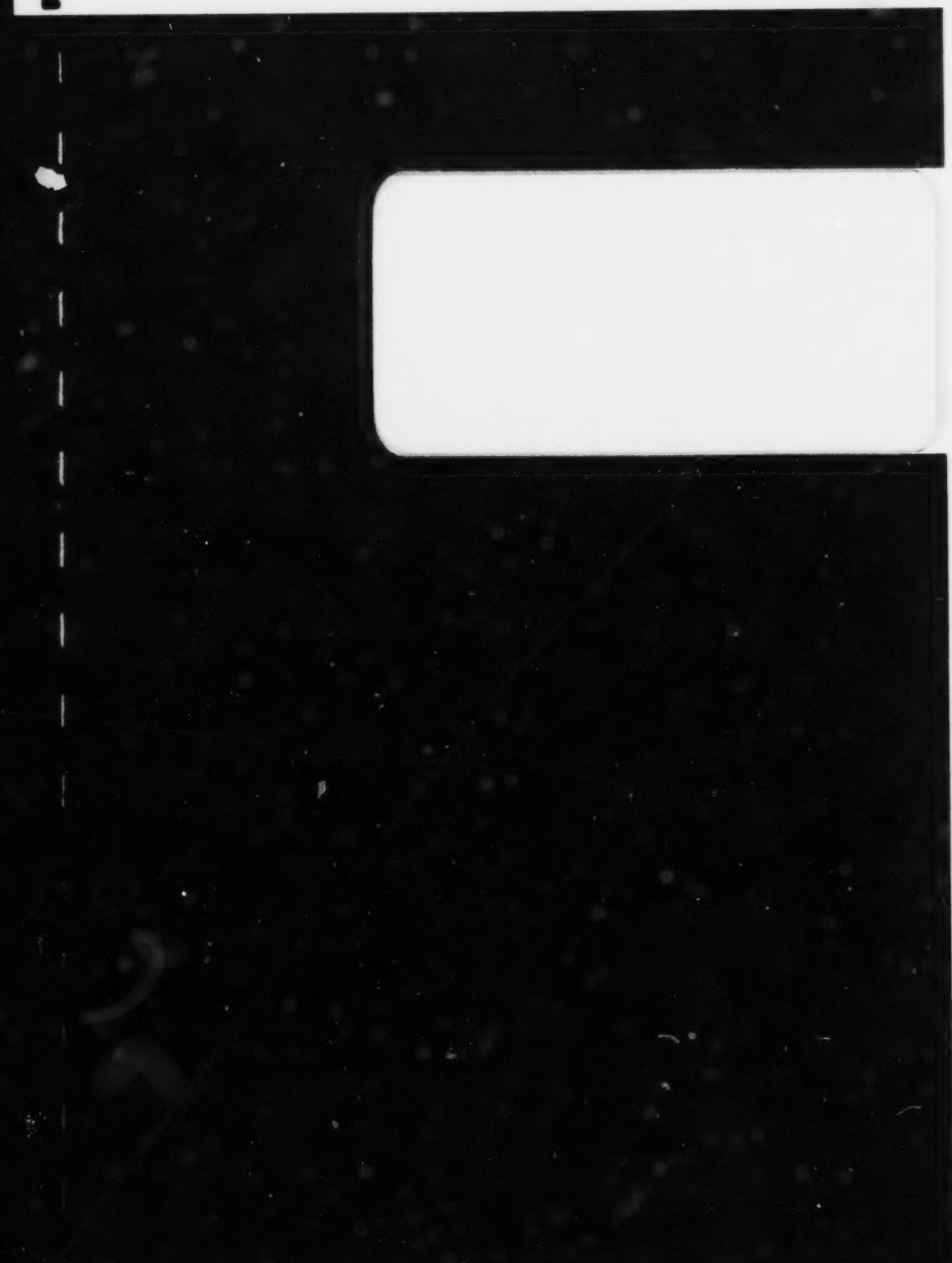
Environmental Assessment

Waste Treatment Facility

OWMC
Ontario
Waste Management
Corporation

A provincial crown corporation.



FACILITIES DEVELOPMENT PROCESS

PHASE 2 REPORT

Progress on the Selection of Facilities and Sites

January, 1982

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1. INTRODUCTION

PURPOSE OF THIS REPORT

This report completes Phase 2 of OWMC's Facilities Development Process (Figure 1). It presents the Corporation's evaluation of the primary information gathered in Phase 1, based on contributions from the public gained through the consultation program and on further analyses of the data by OWMC and its consultants. As part of the Corporation's communications program, the report provides the basis for further public consultations in Phase 3, during which the preferred system options and candidate sites will be chosen.

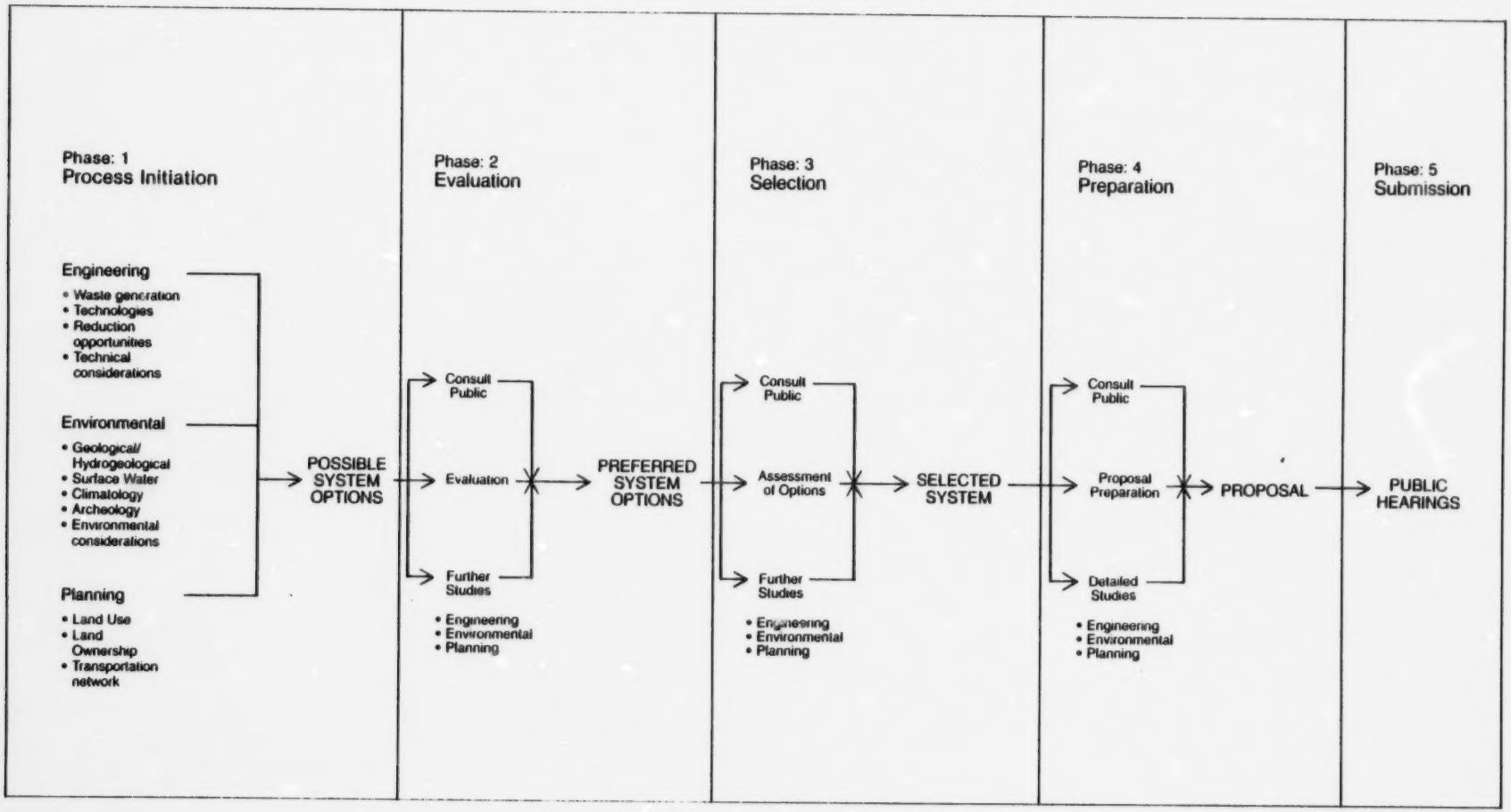
As in the Phase 1 Report, specific sites are not identified here. The selection of candidate sites will occur at the end of Phase 3 when more specific assessments have been made of:

- the size and extent of facilities required by OWMC, based on quantitative estimates of waste streams likely to come to these facilities,
- the factors and considerations to be used in selecting sites for specific facilities.

The purpose of this report is to examine these two key planning issues. Chapter 3, in particular, outlines the planning decisions OWMC has taken in Phase 2 on the size and type of facilities required. Chapter 4 then looks at the site selection issue and outlines a methodology for selecting appropriate sites. In doing so, it explains the Phase 2 decision to focus the search for sites on a particular geographic region of Southern Ontario. The Phase 2 public consultation program, and the issues and concerns raised over the past four months in particular, are discussed in Chapter 2, and the Phase 3 planning and consultation program is outlined in the final chapter.

FACILITIES DEVELOPMENT PROCESS

Figure 1



BACKGROUND INFORMATION

OWMC's mandate

OWMC was created in 1981 by the Ontario government because of the pressing need in Ontario to establish treatment and disposal facilities for liquid industrial waste and hazardous waste. At the time, the extent of the waste problem was not fully known.

Many industries in the province generate potentially hazardous waste materials. Some of this waste is treated on-site by the generators themselves; other portions are transported to off-site treatment and disposal facilities. But it was not known in 1981 how much waste was generated in total or how much of it was being properly managed. Some quantities of hazardous waste were being disposed of in ways that could pose a threat to human health and the environment, and current waste management facilities were not sufficient to eliminate all unacceptable practices across the province.

Therefore, the need for additional facilities was confirmed. But how large they should be and exactly which treatment processes they should include were not known.

To plan facilities in this situation, OWMC has carefully re-examined the problem it was created to solve. Consequently, OWMC now considers its mandate to include the following:

- assessing the types and quantities of waste that require special treatment and disposal in Ontario;

- planning the appropriate facilities and selecting sites based on this information and on a comprehensive review of siting considerations;

- formulating a detailed proposal in light of information and advice gathered from interested organizations and from the general public and presenting it to a formal public hearing;

- building and operating the facilities;

- undertaking other programs that will affect the generation and management of waste, such as encouragement of recovery, recycling, and reuse practices.

The assessment to date

During Phase 1, OWMC undertook to determine how much waste generated in Ontario is not being adequately managed at present. Two problems complicated this investigation:

- The Ontario statistics on waste generation and waste management were inadequate for a complete assessment. Existing data sources, such as the Waybill records of the Ministry of the Environment, covered only part of the problem or were not sufficiently detailed to serve as a sound basis for planning.

- There was no commonly accepted objective and practical standard to evaluate and compare the degrees of hazard represented by the varying combinations and concentrations of substances in different types of waste.

Together, these two problems meant that a waste quantities study had to be undertaken that was sufficiently comprehensive and detailed to provide a basis for planning facilities. The study would have to adopt a definition of waste that would capture all the types of waste posing potential danger to human health or the environment.

To meet these requirements the concept of 'special waste' was developed. As explained in the Phase 1 Report, special waste is all non-radioactive waste that cannot properly be treated and disposed of by conventional municipal facilities, such as sewage treatment plants, municipal incinerators, and municipal landfills.

Such 'special' waste is distinguished from 'conventional' waste by requiring treatment and disposal technologies that are not currently

available in the public sector in Ontario. In OWMC's view, special waste represents the problem it must deal with and manage. (See Appendices A and B.)

An important aspect of the Phase 2 consultation program was the waste quantities verification project. This project, which is still continuing, focuses on the Phase 1 Waste Quantities Study and consists of two main activities. First, a three-member Waste Quantities Task Force was created in September to examine the methodology used in the study and to recommend any appropriate refinements of this methodology and of the definition of special waste in particular. Second, OWMC staff are conducting meetings with municipal officials and industry representatives to compare estimates of waste quantities and the present fate of wastes. This project will conclude in Phase 3.

THE PHASE 1 PUBLIC CONSULTATION PROGRAM

During Phase 1 the Corporation's approach to the waste management problem was reviewed with representatives of industry, citizens' groups, and professional organizations across the province. More than one thousand organizations and individuals were contacted by mail.

At six seminars conducted jointly with the Association of Municipalities of Ontario, municipal officials and administrators discussed provincial and regional waste management needs.

Separate meetings were held in Phase 1 with provincial organizations such as the Ontario Federation of Agriculture and the Provincial Council of Women of Ontario, and with thirty-four other broad interest groups. In all, more than three hundred meetings were held. During Phase 2 these public consultations continued and they are described in Chapter 2 of this report.

WHAT THIS REPORT COVERS

The contents of this report cover the following topics:

- the public consultation program and its influences on Phase 2 (Chapter 2);

- how estimates of the types and quantities of special waste could be affected by decisions based on improved information, economic trends, legislative decisions, and OWMC's own options and mandate (Chapter 3);

- the bases on which OWMC's facilities are being planned (Chapter 3);

- OWMC's decision to concentrate its search on a particular geographic region in Southern Ontario (Chapter 4);

- the procedure for a systematic search for sites within this geographic region and the siting factors to be used in Phase 3 (Chapter 4);

- the work to be undertaken in Phase 3 (Chapter 5).

2. THE PHASE 2 PUBLIC CONSULTATION PROGRAM

INTRODUCTION

This chapter summarizes the Phase 2 public consultation program. The program's structure is briefly outlined; each key issue in the Phase 1 report is then discussed, including the public's reactions and the effect of that response on OWMC's plans and decisions.

While the issues outlined in this chapter were the ones most frequently discussed in the meetings held, many additional concerns and questions were raised. At the end of this chapter, these concerns and questions are documented, along with the response the Corporation has been able to provide at this stage in its development.

In this chapter, and throughout the report, the term 'groups and individuals' is used when referring to the public. This reflects the fact that no sampling or systematic polling of the general public was conducted. Instead, the views and concerns presented to OWMC in Phase 2 came from groups or individuals, either on their own behalf or as part of an organization, delegation, or association, in meetings held with and written briefs received by OWMC.

BACKGROUND

The Phase 2 public consultation program began on 9 September, 1982 with the distribution of the nine Phase 1 studies and a summary Phase 1 report. From September through to December, the program proceeded on the following basis:

- Meetings were scheduled by OWMC with provincial associations and groups which had already expressed an interest in and met with OWMC during Phase 1.

- OWMC scheduled a series of regional meetings in Chatham, Sarnia, London, Hamilton, Toronto, and Oshawa. The meetings scheduled for

Hamilton and Oshawa were cancelled because of a lack of response. Announcements of the dates and places of these meetings appeared in regional daily and weekly newspapers, were outlined in the Corporation's newsletter OWMC Exchange, and were distributed as a special announcement with the Phase 1 study results. Individuals and groups wishing to meet with OWMC were invited to call a toll-free number to make an appointment at one of the locations.

- OWMC also met with a wide range of professional and citizens' groups and municipal representatives who were unable to attend one of the scheduled regional meetings.

In total, OWMC met with groups and individuals in twenty-five meetings to discuss Phase 2 issues, and Appendix C lists the dates and locations of these meetings.

MAJOR ISSUES

In the Phase 1 Report, OWMC listed several issues and questions that it would be considering and on which it would be seeking public advice in Phase 2. A summary of these key questions follows; under each question the concerns and views expressed by these groups and individuals and the Corporation's responses are discussed.

- **In selecting sites, what emphasis should OWMC place on transportation costs and risks?**

Discussions on this issue invariably focused on the perceived risks and costs of transporting hazardous waste over long distances. 'Would it not make sense,' individuals often asked, 'to locate facilities as close as possible to the major sources of waste?' 'And if 70% of this waste is estimated to come from the Golden Horseshoe, would it not seem appropriate to locate the facilities there?' ('The Golden Horseshoe' refers to the highly

industrialized region around the western end of Lake Ontario. (See Figure 2).

The discussion of transportation costs and risks consistently led to the issue of social justice, which took two forms. First, many urged OWMC to place its facilities in areas which enjoy the benefits provided by industries that generate the larger volumes of waste, although it should be noted that most groups expressing this view were from outside the Golden Horseshoe. Second, OWMC was urged not to make a single community the repository for all special waste from across the province. For these reasons, comments on 'centralized' versus 'dispersed' treatment and disposal facilities almost invariably urged that a dispersed option was preferable, and that a system of regional transfer stations, in addition to the main facilities, made sense.

OWMC response:

In determining where in Southern Ontario to begin focusing its attention in Phase 3, OWMC has taken into consideration the transportation issues that were strong themes of the Phase 2 consultation program, as well as environmental, economic, and engineering factors. As outlined in Chapter 3 of this report, OWMC has concluded that it should look for appropriate sites first in the Golden Horseshoe, and it will be concentrating its attention in this region in Phase 3.

The social justice issue and the comments OWMC has received on a centralized versus a dispersed treatment and disposal system are more difficult to weigh and evaluate. The views on this issue were quite similar and repeated often. But it must be remembered that most of the discussions held during Phase 2 occurred outside the Golden Horseshoe. And the question becomes more complicated when it is realized that each major facility component, wherever located, would in fact be receiving all wastes of certain types and classifications from across the province.

- **What priority should be placed on <u>environmental and land use factors</u>, particularly in relation to transportation and other costs?**

Discussion of this question often reflected the view that the environment must be protected in selecting sites, even if this meant that the sites had to be located further away from the areas of major waste generation. On the issue of land use, a frequently mentioned concern was the need to preserve agricultural land and to respect existing local plans. While other environmental factors clearly ranked higher in the groups' opinions, the impact OWMC will have on land use, particularly in rural agricultural areas, ranked nearly as high, and the question was raised in almost every meeting.

Specific concerns focused most often on the landfill design, the character of the treated waste to be deposited, the methods of monitoring and controlling the leachate, and the need for a policy on perpetual care of the facility. There appeared to be little awareness or understanding of the various treatment technologies outlined in the Phase 1 report, although questions were asked about the type of effluent produced and whether existing sewage treatment facilities could handle these effluents adequately.

OWMC response:

OWMC has placed environmental protection as a primary consideration as it begins to focus its search for sites, and this search will concentrate on geological/hydrogeological Zones 1 and 2 in the Golden Horseshoe where soil conditions offer greater potential for natural containment. OWMC will <u>not</u> discharge to the environment any materials considered to be special waste.

With respect to the land use factor, OWMC will examine the possibility of siting facilities within the Golden Horseshoe on industrially designated or publicly held land. If this seriously limits the choice of options, other

lands may have to be examined to ensure sufficient choices are available in case problems are discovered on preferred locations.

- **Are there interim measures that OWMC should adopt before the major facilities are in place?**

There was wide support for investigating such possibilities - particularly mobile treatment facilities, regional collection and storage facilities, the development of model facilities at existing plants, or the temporary use of under-utilized treatment capacity that may now be available in the province. While there was general agreement on the immediate advantages to be gained from the implementation of interim measures, OWMC was cautioned not to spend time examining marginal or inadequate measures.

OWMC response:

OWMC is approaching this issue cautiously. Only if there is a demonstrated advantage - a significant impact on either the large volume waste streams or the more dangerous wastes - can the Corporation justify the time and money required, some of which would have to be diverted away from the main facilities development program. The Corporation has commissioned a study of mobile treatment systems in use internationally and their applicability to Ontario waste, and will investigate the possibilities of utilizing existing treatment capacity in the province.

- **How far and how fast should OWMC go in assisting industries to reduce and recycle waste?**

The issue of recycling and reducing waste was discussed at length in all public meetings. Most people felt this to be an important and urgent task facing OWMC, and in some cases the Corporation was criticized for not pursuing this issue more aggressively. There is a widespread and growing belief that a long-term waste management strategy must pay more attention to determining how waste generation can be reduced. Within

some industry groups the Corporation heard concerns that OWMC was going to compete for a share of the recycling business and that it had an unfair competitive advantage because of the likelihood of forgivable capital grants from the government.

OWMC response:

OWMC agrees that assisting industry in its efforts to reduce and recycle waste is an important part of its mandate, and is determining how best to implement this long-term role. For example:

- Should OWMC hire experts in various process technologies, and make these experts available to industry?

- Should OWMC support longer-term research and development, either with industries or with national or provincial research agencies?

In late January, OWMC expects the results of a study it has commissioned with the Ontario Research Foundation, which will play an important role in assisting its planning in this area. Following review by OWMC staff, the report will be made available to the public in February.

In the meantime, OWMC has launched a public information program, in consultation with several province-wide associations, where important recycling, reduction, and reuse issues will be raised.

° **Are the conclusions OWMC has reached in Phase 1 on the definition of special waste and the selection of certain treatment and disposal technologies reasonable?**

There was little detailed discussion of the definition of special waste or of the technologies presented in the Phase 1 report. Instead, discussion shifted to two concerns. First, the environmental and public groups often asked how OWMC could be assured that wastes - particularly the most dangerous ones - would come to their facilities once built? Second,

industry representatives in particular questioned how OWMC would determine the size of its facilities and whether it would aggressively compete through its pricing and marketing policies for all special wastes.

OWMC response:

Both these issues are discussed in more detail in Chapter 3 of this report. The size of OWMC facilities is one of the most important planning decisions to be made within the next several months. While debate could continue indefinitely about waste generation statistics, pricing, marketing, and future regulation issues, the Corporation has adopted a policy, outlined in Chapter 3, that reflects three principles. The initial capacity shall be:

- smaller than OWMC's best estimate of the quantity that will ultimately come to its facilities, to avoid wasteful overdesign;

- able to provide a comprehensive range of technologies sufficient to make a significant impact on the most hazardous wastes in particular;

- flexible and capable of modification to suit changing trends in waste generation and revised estimates of waste quantities.

ADDITIONAL QUESTIONS AND CONCERNS

In addition to these major issues, several other questions and concerns were repeatedly raised in the meetings. The following is a summary of these questions and OWMC's responses:

- **What is OWMC's mandate and administrative relationship with the Ministry of the Environment (MOE)?**

OWMC is a provincial crown agency, responsible for developing a provincial special waste management program. A seven-member Board of Directors, appointed by the Lieutenant-Governor in-Council, oversees the

operations of the Corporation. OWMC has no regulatory authority - in fact, its own treatment and disposal facilities will be subject to Ministry of the Environment regulations. In addition, OWMC has no responsibility for treating and disposing of solid municipal waste or radioactive waste.

Over the next several months, OWMC will be issuing statements and publications on a number of issues related to its mandate. This will provide an opportunity for further discussion of the OWMC-Ministry of the Environment relationship.

- **Will OWMC facilities accept and treat waste from other jurisdictions, particularly the United States?**

This is a possibility, but only under certain circumstances. OWMC's Board of Directors has determined that OWMC facilities will accept wastes from other jurisdictions only on a reciprocal basis. If some Ontario wastes are accepted for appropriate treatment and/or disposal in the United States or other provinces, OWMC itself would be prepared to consider treating comparable quantities of wastes from such other jurisdictions.

- **Will OWMC provide compensation for those affected by its facilities, for example those whose land values decrease?**

OWMC will discuss appropriate compensation arrangements for those in the immediate vicinity of OWMC facilities who have experienced demonstrated financial loss, because of potentially depressed land values.

- **Will participants in OWMC's public consultation program be given adequate time to consider OWMC proposals before responding?**

Throughout the OWMC public consultation program, every effort will be made to provide as much time as possible for consideration of OWMC proposals before meetings are scheduled. Through the use of workshops, small group meetings, seminars, and advance notice of meetings, OWMC

hopes to meet this concern. In addition, once OWMC submits a detailed proposal to the Hearing Panel, it will recommend to the Panel that a three month period be provided for distribution and consideration of the proposal before formal hearings begin.

- **Will funding and other resources be provided to pre-Hearing and Hearing participants, including access to expert advice?**

OWMC has agreed to provide funds to participants in the public hearings on the basis of criteria established by the Hearing Panel. OWMC cannot and should not establish the criteria or assess individual applications for funding; this should be a responsibility of the Hearing Panel.

Prior to the formal hearing stage of the project, OWMC is prepared in principle to provide funding and other resources to participants in the consultation program. OWMC is developing a funding policy, which will be distributed for public comment before any policy is adopted.

- **How can OWMC be sure that wastes will either come to its facilities or be adequately treated elsewhere? What regulations will be in place to ensure this occurs?**

This is a critical issue and one that OWMC cannot solve on its own. Regulations are made by the Ministry of the Environment; however, in designing its facilities OWMC must take into account likely changes in regulations which may result in its treatment facilities receiving wastes now being inadequately managed.

The Minister of the Environment recently announced that a major review of all waste management policies is taking place within the Ministry. New proposals will be issued for public review next June. In the meantime, the Ministry is inviting public submissions on these issues. OWMC will be presenting a brief to the Ministry on the issue of future industrial waste management regulations and will make this brief available to the public.

- **When will the procedures to be used at the public hearings be made public?**

The Hearing Panel is responsible for establishing the procedures to be used in the public hearings. OWMC believes that a public meeting should be held to discuss hearing procedures as soon as possible after OWMC files a proposal with the Hearing Panel. We also believe that no procedures should be decided upon in advance of such a meeting. In the meantime, comments on the hearing procedures should be addressed to the following:

Executive Secretary
Hearing Panel on Industrial Waste Management
1 St. Clair Avenue West
9th Floor
Toronto, Ontario
M4V 1K6

(416) 965-8051

- **Will the 'treated' wastes that go to OWMC's landfill still be highly toxic?**

In designing the treatment processes and the landfill, OWMC will treat all wastes to the highest degree possible. These treated wastes - most of them in residual form following the treatment process - will still require safe storage and regular monitoring. The methods to be used in treating the original wastes, and monitoring the residuals - including the siting, construction, and proper maintenance of a landfill - are issues that OWMC is prepared to examine closely in the upcoming consultation meetings and in the public hearings.

- **Will hazardous wastes continue to be disposed of in municipal sewage systems once OWMC facilities are available?**

This will depend of course on what regulations and municipal bylaws are in place governing the treatment of liquid industrial waste in sewage treatment plants. OWMC has listed for public discussion a large number of industrial wastes which, in its view, cannot be adequately treated in existing municipal sewage treatment facilities. But this list is by no means exhaustive. There must be more consideration of what can be adequately treated in municipal facilities before this issue can be resolved.

- **Will OWMC subcontractors be subject to rigorous public scrutiny?**

OWMC will be responsible for the management of its facilities and will enforce safety and monitoring procedures. These procedures will be presented at the public hearings. No decision has yet been made on whether any or all of the operation of OWMC's facilities will be subcontracted.

- **Will OWMC document the public consultation process so that the Hearing Panel will be aware of the views of those not attending the hearings?**

Transcripts and written summaries of public meetings and discussions are being maintained by OWMC, and a public consultation report is written at the end of each phase of its work. OWMC intends to file these as Supplementary Information in its proposal to the Hearing Panel; however, any group wishing to make its views known to the Hearing Panel should plan to make a presentation at the hearing.

- **How will OWMC affect existing municipal and industrial waste management practices?**

OWMC realizes it will be setting new standards for treating and disposing of industrial waste in the province. OWMC facilities will provide an alternative to present practices and, supported by appropriate regulations, will ease current pressure on municipal waste treatment and disposal facilities in particular. Pricing and marketing policies will also affect industrial waste management practices, including the future recycling of wastes. It is impossible to predict what this effect will be until pricing and marketing policies have been established, OWMC facilities are opened for business, and any new regulations are put in place.

3. OWMC PLANNING ISSUES

FACTORS AFFECTING THE SIZE AND TYPE OF OWMC FACILITIES

A number of issues have been identified that could affect both the types and quantities of waste that may be expected to come to OWMC for management. This in turn will affect the type and size of treatment and disposal facilities constructed. Most of these issues were identified and discussed in the Phase 2 public meetings, and it is useful to summarize them here:

- economic factors - future industrial growth or recession, the introduction of new production technologies, an increase in waste reduction and recycling practices, and the future plans of privately operated waste treatment facilities;

- regulations - future governmental regulations affecting the amount of waste requiring special treatment;

- the role of OWMC - its pricing and marketing policies and its role in encouraging reduction, recycling and reuse programs; ultimate decisions on the definition and impact of special waste and the adequacy of current treatment practices. As a result of further investigations by OWMC, the amount and types of waste requiring special treatment might be increased or decreased from estimates made in Phase 1.

The resolution of each of these planning issues will have different effects on the final estimates of the types and quantities of waste requiring special treatment. The complexity and unpredictable nature of these issues is summarized in Table 1 on the following page.

TABLE 1

OWMC PLANNING ISSUES

1. Economic factors

   (a) Growth/recession: General economic expansion or recession will affect the generation of special waste.

   (b) Introduction of new technology or industrial processes will affect the generation of special waste whether or not growth occurs.

   (c) Expansion of waste reduction, reuse, and recycling practices: These practices could reduce the primary generation of special waste and also remove some special waste components from the waste stream.

   (d) The expansion or contraction of current privately-operated waste management companies will affect amount of wastes coming to OWMC facilities.

2. Regulatory framework

   (a) Changes in legislation could lead to significant changes in the generation and management of special waste. The Ontario Ministry of the Environment recently announced a review program of waste management policies in the province.

   (b) At present, the Province of Ontario does not restrict the import or export of any type of special waste. (However, the United States restricts importation of liquid PCB's).

TABLE 1 (Continued)

OWMC PLANNING ISSUES

2. Regulatory framework (Continued)

(c) If regulations become more strict in Ontario the export of special wastes may increase. Some types of special waste could be reduced or eliminated.

(d) If the treatment of special waste in Ontario is less expensive than in the United States or other provinces because of permissive legislation this may encourage importation of waste. If controls are not applied new types may enter Ontario.

3. The role of OWMC

(a) OWMC's waste generation verification project: This project is presently examining the Phase 1 estimates of special waste quantities in Ontario. As a result of the waste generation verification project or for other reasons, such as improved information on the hazards of waste streams, the quantities of special waste may be revised.

(b) Impact of special waste: The dangers represented by the various kinds of special waste will be continually evaluated. This might change the constituents of special waste or affect priorities for management.

TABLE 1 (Continued)

OWMC PLANNING ISSUES

3. The role of OWMC (Continued)

(c) OWMC's relationship to the privately-operated waste management industry. Waste presently being adequately treated might be attracted to OWMC facilities.

(d) Reduction, reuse, and recycling program: A study of the potential in Ontario for reduction, reuse, and recycling has been commissioned by OWMC. This could have a long-term effect on current waste requiring treatment.

OVERALL CONCLUSIONS ON PLANNING ISSUES

Quantities of waste generated

Information on waste quantities that should come to OWMC's facilities is not yet firm enough to allow the size of facilities to be planned precisely. Moreover, the economic and policy variables will always make prediction difficult. In general, however, the total quantity of special waste needing treatment and disposal in Ontario will probably not increase much from its present level and may decline.

Types of waste needing management

The types of waste that will need special treatment and disposal probably will change gradually over time with a strong tendency for the number of specific waste streams to diminish. At present, however, all constituents of special waste are potential wastes for OWMC's facilities.

PHASE 2 - PLANNING DECISIONS

Despite the uncertainties surrounding the ultimate effects of the planning issues on the types and quantities of waste coming to OWMC facilities, the Corporation must begin to distinguish those issues that can be resolved now, and can form the basis for the important Phase 3 decisions on the type and location of facilities.

For this reason, a number of planning assumptions must now be adopted which will govern the decisions that lie ahead. OWMC has made the following planning assumptions on the type of system to be developed.

1) **OWMC facilities, no matter how large or small they ultimately become, must be designed to handle all types of special waste.**

The Waste Quantities Study completed in Phase 1 showed that special waste consisted of seventy-nine individual waste streams collected into fourteen general or aggregate categories (see Appendix A).

Eventually some new individual streams as well as aggregate types of waste may be added and some current ones may be eliminated from the total.

At the moment all fourteen waste categories contain individual waste streams with the potential to have serious effects on human health and the environment. Therefore, no category of special waste can be disqualified as a potential candidate waste for OWMC's facilities.

2) **Special waste must undergo treatment to the fullest possible extent, and the remaining residues must receive the most secure containment possible.**

In Phase 1 the Generic Process Technologies Study described a wide variety of methods for treating hazardous waste. Some methods are forms of treatment in which wastes are destroyed, detoxified, or immobilized. There are many treatment options.

All such treatment and containment may not have to be done by OWMC. Some OWMC residues might be disposable in landfills other than those owned by OWMC; some treatment processes undertaken elsewhere might adequately prepare residues for an OWMC landfill. These possibilities are being investigated.

3) **Based on assumptions 1 and 2 above and on an engineering analysis by OWMC's consultants, OWMC has concluded that the initial treatment and disposal facilities should be as follows:**

- the system should consist, at the minimum, of incineration, physical/chemical treatment including solidification, and secure landfill;

- only one installation of each major component is contemplated at this time.

Therefore, for initial planning purposes the facilities to be developed consist of the following:

Incineration

Physical/Chemical Treatment

Secure Landfill

Size and capacity of the facilities

The planning assumptions above do not address the critical question of the size of the facilities.

The eventual capacity of OWMC's facilities cannot be predicted now for all the factors influencing the estimates of quantities discussed earlier:

- economic trends,
- legislative and regulatory decisions,
- OWMC's options and mandate.

The eventual capacity required for OWMC's facilities may never be entirely predictable in advance. Therefore, the planning of facilities cannot begin with a firm estimate of ultimate size.

In the absence of this information, certain key principles must be adopted now to guide decisions in Phase 3 on the issue of size:

1) The initial installation should be capable of expansion through designs that leave room for new construction, equipment that allows for modular expansion, and technologies that favour increased capacity through extra shifts, wherever practical, rather than additional construction of new installations.

2) The initial design capacity of the facilities should be lower than OWMC's best estimate of the final quantity that will ultimately come to its facilities, to avoid design of wasteful excess capacity.

3) The initial capacity should be large enough to make a significant impact on the problem of special waste, particularly the most potentially hazardous waste streams, and to allow all treatment components to operate efficiently.

Probable environmental impact of facilities

The Phase 1 Report identified discharges to the environment from the treatment and disposal processes that must be managed and monitored closely. The environmental impact of OWMC's facilities are an area of concern identified in discussions with the public. It will be briefly described in this report and discussed in greater detail in Phase 3.

Each component has distinct environmental impacts that will govern the initial siting and design plans. Since the three main facility components have different impacts, they have different siting requirements.

Discharges from the incineration component

The incineration system under consideration by OWMC produces a liquid effluent requiring treatment prior to discharge to the environment. Moreover, gaseous emissions will be discharged through a stack. All discharges will be monitored and controlled to meet any existing environmental standards. The solid inorganic residues (i.e. slag and fly ash) cannot be discharged to the environment and must be disposed of safely in a landfill.

Discharges from the physical/chemical component

Physical/chemical treatment processes are quite varied. They produce liquid effluents that can be discharged to a suitable sewage system.

Physical/chemical treatment also produces semi-solid or solid residues that must be contained in a secure landfill (inorganic residues).

Discharges from the secure landfill

The leachate strength produced from a secure landfill is minimized since all incoming waste is pre-treated. The high degree of immobilization that is achieved results in only weak leachate occurring. The quantity of leachate produced is minimized by the landfill top seal and other design features. All leachate is captured and tested. If it meets environmental standards it can be discharged. When contaminant levels in the leachate surpass discharge standards, the leachate is treated like any other special waste stream.

OWMC discharge standards

All liquid effluents and gaseous emissions will meet existing federal, provincial, and municipal standards for water and air. OWMC will continually review these standards and will ensure that its discharges are of the highest environmental quality.

4. THE SELECTION OF SITES

INTRODUCTION

This chapter outlines the basic steps OWMC proposes to take in the search for and selection of appropriate sites for its facilities. The selection of sites is a difficult task: not only must it take into account many complex planning factors - most of which are unresolved at this stage - but it also must be based on a clearly understood set of guidelines which have been subjected to public review and comment.

At the outset, it is important that the terms and definitions used in this process, and the basic guidelines that form its starting point, be clearly understood. First, some key definitions, used throughout the process:

Geographic region - One or more large geographic regions in Southern Ontario - e.g. Eastern Ontario, the Golden Horseshoe, Southwestern Ontario, Central Ontario.

Candidate areas - One or more areas that might range up to forty kilometres in diameter where facility components could be sited. Several candidate areas could be located in a single geographic region.

Candidate site(s) - A specific location - a piece of property - where one or more of the facility components could be located. One or more candidate sites could be located in a candidate area.

The definition of siting factors, and the process of applying these factors to narrow the search for sites, must stem from a process that is consistently applied at each stage. To do so, it is appropriate to outline here the guidelines for the process:

- no geographic region can be ruled out definitely until one or more specific candidate sites are finally chosen.

- preferred candidate areas and eventually candidate sites will be chosen by applying selective factors, after public consultation.

- the selection process will progressively narrow the focus of attention from candidate areas to specific sites.

- if suitable sites are not found by means of this narrowing process, the candidate regions previously set aside will be reconsidered.

TYPES OF FACILITIES - CENTRALIZED OR DISPERSED?

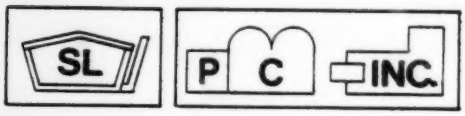
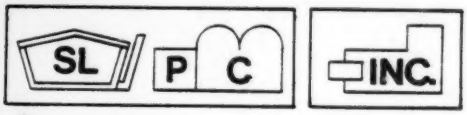
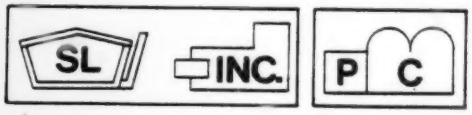
How the facility components might be geographically distributed is a critical issue to be considered in the process of selecting sites. As the Phase 1 Report outlined, the main components - incineration, physical/chemical treatment, and landfill - might not be located on the same site. These three basic components have different siting requirements based on their different environmental effects. These requirements are summarized below.

Component	Fundamental siting requirements
	Suitable hydrogeological setting required for all components.
Incinerator	Produces scrubbed gases which have to be dispersed into the atmosphere and liquid effluent which must be discharged to a suitable sewage treatment plant. Smaller area required.

Component	Fundamental siting requirements
Physical/Chemical	Produces liquid effluent which must be discharged to a suitable sewage treatment plant. Smaller area required.
Secure Landfill	Suitable hydrogeological setting of sufficient area. Larger area required.

There are five possible facility/site combinations, and the site requirements of each site are as follows:

COMBINATION	SITES REQUIRED
1. Centralized facilities	ONE SITE Suitable hydrogeological setting of sufficient area, accessible to sewage treatment, suitable for adequate atmospheric dispersal
2. Dispersed facilities A B C	THREE SITES A - Sufficient area. B - Smaller area, accessible to sewage treatment C - Smaller area, both accessible to sewage treatment and suitable for adequate atmospheric dispersal.

COMBINATION	SITES REQUIRED
3. Partially centralized facilities  A B	TWO SITES A - Sufficient area. B - Smaller area both accessible to suitable sewage treatment and suitable for atmospheric dispersal.
4. Partially centralized facilities  A B	TWO SITES A - Sufficient area and accessible to suitable sewage treatment. B - Smaller area, both accessible to suitable sewage treatment and suitable for atmospheric dispersal.
5. Partially centralized facilities  A B	TWO SITES A - Sufficient area, both accessible to suitable sewage treatment and suitable for adequate atmospheric dispersal. B - Smaller area accessible to suitable sewage treatment.

SELECTING APPROPRIATE SITES

The following pages outline how OWMC proposes to search for and select appropriate sites. Whether a centralized, partially centralized, or dispersed system is selected will, of course, depend on how the siting requirements for each component outlined earlier in this chapter are accommodated by the factors proposed for each step of the process. Enough candidate sites may be found that a choice will still remain between fully centralized and more dispersed options. As described above, up to five combinations are theoretically possible.

There are two important considerations to bear in mind when evaluating the factors in the search and selection process:

1) They are OWMC's best judgement to date, and the addition, exclusion, and ranking of factors will take place once the public has been consulted.

2) Some of the factors are common to all major components of OWMC facilities, whereas others affect only the incinerator or the physical/chemical treatment component.

The following process involves five basic steps. OWMC has determined in Phase 2 that sufficient information is now available to warrant taking the first step - narrowing the focus immediately to a specific geographic region. From this point on, however, each proposed step depends on factors that at this stage are only suggested and are subject to early public discussion in Phase 3 before they are applied in the site selection process.

THE SEARCH AND SELECTION PROCESS
(See chart - The Search Process)

Step One: Narrowing the search to a geographic region

OWMC believes it is now appropriate to narrow the search for candidate areas and candidate sites, on the basis of the planning and engineering factors identified in Phase 1 and 2, and the public consultations that have taken place. From this process, the following two factors - transportation and environmental - have been identified as the determinants for focussing initial attention on a specific geographic region:

Transportation: The Waste Quantities study showed that approximately 70% of special waste in Ontario is generated in and around the Golden Horseshoe area at the west end of Lake Ontario. Because the costs of transporting special waste on public roads are significant and increase in proportion to the distance travelled, there would have to be strong compensating reasons to consider locating outside the Golden Horseshoe area.

Environmental: To ensure that natural geological/hydrogeological protection is present for all three components of the system, the focus of the search for sites with suitable hydrogeological characteristics should be on Zones 1 and 2 as documented in Phase 1.

The decision to concentrate attention on the Golden Horseshoe, as near as possible to where the bulk of wastes is generated in Ontario, is consistent with the public concern expressed earlier in this report, particularly the concern for social justice.

The combined influence of the transportation and environmental considerations clearly steers OWMC to focus its efforts initially on Zone 1 and 2 in the Golden Horseshoe (see Figure 2 shaded areas).

This decision contains two important caveats, however:

- Transfer stations may be located in other parts of the province; specific areas have not yet been identified.

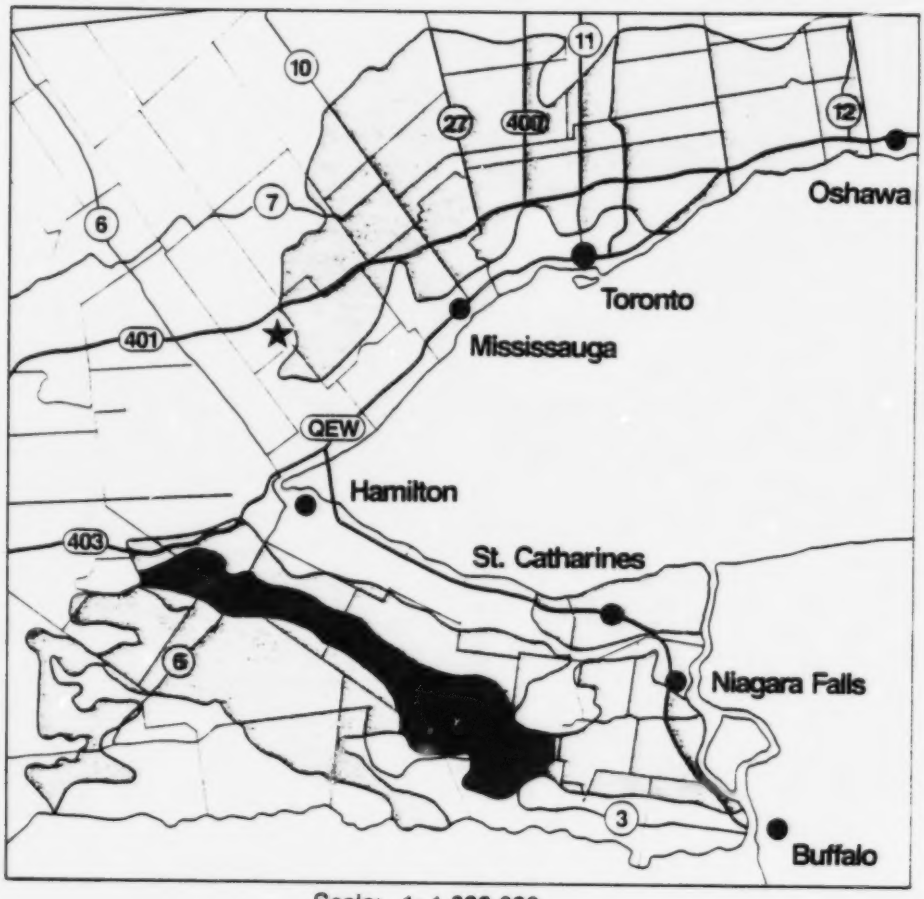
- The geographic regions set aside by this focused effort will be reassessed if OWMC fails to locate suitable sites in Zones 1 and 2 of the Golden Horseshoe.

Step Two: Selecting candidate areas within the the Golden Horseshoe for components

Having identified the Golden Horseshoe as the preferred geographic region, OWMC must next identify candidate areas for each treatment process.

The five combinations of centralized and decentralized options outlined earlier will be further evaluated at this stage, so that a preferred system can be chosen. This system would then be carried into the remaining steps in the site selection procedure. The preferred system will be selected on the basis of three key considerations:

Figure 2



Scale: 1: 1,000,000

SELECTED GEOGRAPHIC REGION - Golden Horseshoe

Legend

★ Southern Ontario Centroid of Waste Generation

Zone 1 — Subsurface conditions generally consist of silt and clay soils. These soils normally have lateral and vertical textural uniformity. As such, this terrain exhibits predictable geologic and hydrogeologic characteristics that will naturally restrict potential contaminant movement.

Zone 2 — Subsurface conditions generally consist of a variety of geologic materials and/or variability within a single geologic unit. Variations in geologic and hydrogeologic characteristics exist but this terrain may locally provide natural containment of potential contaminants.

Note:	Only the shaded zones will be studied for candidate areas and site selection.

- ° The preferred system should minimize environmental total impacts and risks.
- ° It should minimize transportation costs between each component of the system.
- ° It should minimize overall costs and the necessity for dispersed management control.

Since the objective of this step in the search process is to narrow the focus to candidate areas (which might be up to 40 km in size), some form of constraint mapping will be needed. The technique initially would be to map the geographical areas that meet the siting requirements and thus by a process of geographic elimination identify the candidate areas.

From the outline presented above the following siting factors are suggested as the basis for identifying candidate areas.

Environmental

- ° The incinerator to be located in areas that will ensure optimal dispersal of scrubbed gases from the incinerator stack.

- ° Both the incinerator and the physical/chemical treatment plant to be located where effluent can be discharged to suitable sewage treatment.

- ° All components - incinerator, physical/chemical treatment plant, and secure landfill - to be located only in Zones 1 or 2 of the hydrogeological study map.

Step Three: Identifying candidate sites within candidate areas

This step identifies candidate sites for each of the system components. It assumes that by this stage decisions on the size and capacity of each component will be possible. These candidate sites will be selected based on the following factors:

Land use, in order of priority:

1) industrially designated land,
2) publicly-held land,
3) privately-owned land.

Step Four: Comparing candidate sites and selecting preferred site(s) for detailed testing

From a comparison of candidate sites a preferred site or combination of sites will be selected on the basis of the following factors (not ranked):

Environmental

- no perennial stream or floodlands,
- no habitats of rare or endangered species,
- no sites of high archaeological or historic interest,
- close to existing or planned sanitary sewage treatment system,
- no adverse local air dispersal effects,
- probability of finding soil to provide desired level of natural containment for each facility component,
- no slopes in excess of 20°.

Transportation

- as near as possible to major highways,
- access routes should have minimal residential use,
- minimize need for routes with bridges and culverts,
- minimize need for special engineering work to upgrade access.

Land Use

- respect for present land use patterns,
- respect for present land use plans,
- minimum number of landowners, if private property required.

Step Five: Detailed testing of selected site(s)

The purpose of this step is to examine the selected site(s) in detail, utilizing the guidelines for environmental impact assessment.

Reconsideration

If, during the selection procedure, it is found that the choice of options open to OWMC is inadequate, there must be provision for reconsidering the factors. The following considerations are suggested:

- If the minimum requirement of a single combination cannot be found by the search procedure, the site-specific factors should be weighed and amended before general factors are reassessed.

- If site-specific factors prevent finding a site or sites for all components, new locations may be considered outside the Golden Horseshoe area. At this point the search procedure will in effect start over again on a wider base.

These considerations propose priorities among the factors. Before adopting such priorities OWMC will be discussing them with the public.

There are in fact two central questions about the search procedure described above for finding sites that OWMC wishes to raise during the Phase 3 public consultation:

- Are all important factors and constraints included in this list?
- What are the priorities among them?

When these questions have been satisfactorily answered the search for candidate sites can proceed.

5. LOOKING AHEAD - PHASE 3

This report marks the completion of the second phase of OWMC's Facilities Development Process. It has outlined the Corporation's decisions on three key issues:

- the planning principles that will guide Phase 3 decisions on the type and size of OWMC facilities, based on an analysis of the Phase 1 information on waste quantities and treatment technologies;
- the geographic region (the Golden Horseshoe) which is now the focus of OWMC's attention for the siting of facilities; and
- a proposed detailed methodology for selecting:
  - the preferred combination (centralized, partially centralized, dispersed),
  - the preferred site or set of sites within the preferred geographic region.

PHASE 3

Decisions on the preferred combination of components, size and the site(s) for treatment and disposal facilities will be based on the work to be done in Phase 3. During this phase OWMC will concentrate on the following activities:

- Further refinement of the Phase 1 waste quantity estimates, based on the results of the verification program now under way.
- Conceptual design of the facility components - incineration, the physical/chemical treatment process, and landfill technology - based on the Phase 2 planning decisions outlined in this report, and further refinement of available engineering information in particular.

- Continuing evaluation of other treatment and disposal options and/or interim measures, including mobile treatment processes, and the possible use of currently under-utilized treatment facilities, if any, in the province.

- Assessment of the results of the Waste Reduction Opportunities Study - report due late January, 1983 - and implications for facilities design and marketing.

- Development of some initial proposals for a pricing and marketing plan.

- Analysis of transportation costs and risks.

- Collection and analysis of available data and information required to implement the proposed site selection procedure outlined in Chapter 4 of this report.

The latter activity - the analysis of available site selection information - is one of the most critical and time-consuming of the Phase 3 tasks. Work will begin immediately to collect the environmental, transportation, land use, hydrogeological, and engineering data required to complete this task.

PUBLIC CONSULTATION

Before decisions can be taken on the key steps in the site selection process, the process itself will be subjected to public examination and discussion. This will be a key function of the Phase 3 public consultation program. Meetings will be scheduled with the provincial groups and associations OWMC consulted in Phase 1 and 2. A special seminar is also being planned to provide an opportunity for more detailed discussion of the methodology.

The Phase 3 consultation program will also provide an opportunity for groups and organizations, especially in the Golden Horseshoe, to meet

with OWMC officials, and regional meetings have been scheduled as follows:

Toronto	- January 25
Brampton	- February 2
Hamilton	- February 4
Oshawa	- February 8
Richmond Hill	- February 15
St. Catharines	- February 17

Individuals and groups wishing to meet with OWMC in one of these locations or wishing to obtain further information can contact the Corporation at 923-2918 or the toll-free number (1-800-268-1179) and ask for Michael Scott, Director of Communications, or Beverly Jaffray, Communications Officer. The Corporation's mailing address is 2 Bloor Street West, 11th Floor, Toronto, Ontario M4W 3E2.

Finally, it may be appropriate, once these consultations have taken place, and the site selection process in particular has been discussed and refined, to issue a Phase 3 interim report, outlining the progress OWMC has been able to achieve in narrowing the search for sites. This would also provide opportunities for further discussions with residents of the candidate areas identified by that time.

OWMC expects that the entire Phase 3 process - concluding with a selection of a specific site or sites - can be completed by April 1983. It is important to remember, however, that the selected site(s) must be evaluated in detail in Phase 4 of the Facilities Development Process. This work must be done before a proposal can be presented to the Hearing Panel. The target for completion of Phase 4 is late 1983.

APPENDIX A

CONSTITUENTS OF SPECIAL WASTE

UCD WASTE *	DESCRIPTION	TYPICAL WASTES	Estimated Waste Quantity (tonnes)
11 ACIDIC SOLUTIONS			
111	Acidic Solution with Heavy Metals	Pickle Liquor Rinse Water	149,000
112	Acidic Solution with Other Metals and Non-Metals	Demineralizer Regenerent	800
113	Other Acidic Solutions	Boiler Stack Scrubber Water with Dilute Carbonic Acid (H_2CO_3)	22,600
12 ALKALINE SOLUTIONS			
121	Alkaline Solution with Heavy Metals	Rinse Waters from Surface Cleaning of Metals	19,500
122	Alkaline Solution with Other Metals	Demineralizer regenerent	700
123	Other Alkaline Solutions	Cleanup Water from Lime or Cement Kiln	55,200
13 METAL FINISHING SOLUTIONS			
131	Metal Finishing Solutions, Acid	Ammonia Based, Containing Copper, Tin, Lead or Cadmium	9,900
132	Metal Finishing Solutions, Alkaline	Contains Strong Complexing Agent and Copper, Tin, Lead and/or Cadmium	1,100
133	Spent Pickle Liquor from Ferrous and Non Ferrous Metals	Strong Acids with Iron, Fluoride, Hydrochloric Acid (HCl), Sulfuric Acid (H_2SO_4), Nitric Acid (HNO_3)	213,400

* UCD University of California at Davis - OWMC's waste classification system is based on the highly comprehensive system developed at the University of California at Davis.

APPENDIX A (CONTINUED)

CONSTITUENTS OF SPECIAL WASTE

UCD WASTE *	DESCRIPTION	TYPICAL WASTES	Estimated Waste Quantity (tonnes)
14 OTHER AQUEOUS SOLUTIONS			
141	Aqueous Solutions with Heavy Metals	Cleaning Solutions from Tanks Trucks, or Railroad Tankers	32,300
142	Aqueous Solutions with Other Metals	Rinse Water from Heat Treating Salt Baths, Contain Barium, Aluminum	200
143	Aqueous Solutions with Reactive Anions	Bleaching Solutions Containing Sulfite, Chlorite, Fluoride, Bromate	2,900
145	Brine	Salt Solutions After Neutralization or Chlor/Alkali Production	5,400
146	Solutions Containing Cyanide	Plating Baths	4,800
147	Solutions Containing Sulfides	Plating Baths	2,600
15 INORGANIC SOLIDS			
151	Inorganic Solids	Foundry Sand with Phenolics	133,000
152	Inorganic Solid Chemicals	Aged or Off Spec. Chemicals Including Lime, Caustic Soda and Partial Containers of Laboratory Size	132,100
16 OTHER INORGANIC WASTES			
165	Spent Catalyst	Maybe Carbon or Metal	2,000
167	Other Inorganic Waste	Ash and Construction Residue	1,700
21 SPENT SOLVENTS			
211	Halogenated Solvents with Heavy Metals	Methylene Chloride, 1,1,1, Trichloroethylene Used for Metal Cleaning	3,700

APPENDIX A (CONTINUED)

CONSTITUENTS OF SPECIAL WASTE

UCD WASTE *	DESCRIPTION	TYPICAL WASTES	Estimated Waste Quantity (tonnes)
212	Halogenated Solvents with Other Metals	Surface Cleaning and Degreasing Solvents	< 100
213	Other Halogenated Solvents	Freon With Other Solvents Used in Chemical Processing	2,000
214	Non-Halogenated Solvents with Heavy Metals	Toluene, Benzene, Xylene Contaminated with Catalysts	17,500
215	Non-Halogenated Solvents with Other Metals	Acetone, Methylisobutylketone (MIBK) used in Paint and Varnish Formulation	300
216	Other Non-Halogenated Solvents	Methylethylketone and Other Solvents Contaminated with Dirt	4,700
217	Unspecified Solvents	Alcohols and Mixtures of Solvents	700
22 OTHER ORGANIC LIQUIDS			
221	Organic Liquids with Metals and Halogens	Dyes	< 100
222	Organic Liquids with Halogens Only	Chloroform, Carbon Tetrachloride	900
223	Organic Liquids with Metals Only	Nickelcarbonyl, Methyl Mercury	200
224	Other Organic Liquids	Creosote and Other Poly Aromatic Hydrocarbons	12,200
225	Aqueous Solutions with Non-Halogenated Residues Less Than 10%	Laboratory Mixtures	3,100
226	Aqueous Solutions with Halogenated Residues Less Than 10%	Waste or Rinse Waters After Degreasing	1,000

APPENDIX A (CONTINUED)

CONSTITUENTS OF SPECIAL WASTE

UCD WASTE *	DESCRIPTION	TYPICAL WASTES	Estimated Waste Quantity (tonnes)
227	Aqueous Solution with Non-Halogenated Organic Residue Greater Than 10%	Laboratory Mixtures	200
228	Aqueous Solution with Halogenated Organic Residue Greater Than 10%	Wash or Rinse Waters after Degreasing	100
24 - 25 OTHER ORGANIC WASTES			
241	Pesticides and Wastes	Partial Containers, Tank Washings, Off Spec. Product, etc.	600
242	PCB Oils and High Strength (over 500 ppm) Liquids	From Transformers and Capacitors	200
243	Pharmaceuticals and Wastes	Off-Spec. Drugs, Cleanup Waters, etc. Includes Items such as Vitamins	1,700
244	Photochemical Waste	Most Solutions Non-Toxic Except those with Silver	5,000
245	Off-Spec or Aged Organics	Can Include Solids or Liquids. Generally in Containers	200
247	Halogenated Still Bottoms	Spent Solvent or Waste Oil Recovery	2,500
248	Non-Halogenated Still Bottoms	Solvent Recovery Operations	7,500
251	Tannery Wastes - Liquid	Solutions with Hexavalent Chromium	1,900
252	Solid or Sludge Tannery Wastes	Leather Shavings with Chrome	1,000
254	Adhesives or Glue	Waste Glues Mostly Aqueous. Some with Phenols	< 100
257	Phenolic Wastes	Phenolic Oil. Toluene Diisocyanide Residue	1,900
258	Waste Tar and Residues		900

APPENDIX A (CONTINUED)

CONSTITUENTS OF SPECIAL WASTE

UCD WASTE *	DESCRIPTION	TYPICAL WASTES	Estimated Waste Quantity (tonnes)
26 POLYMERIC MATERIAL WASTES			
261	Polymeric Resin	Polyester, Urethane, Etc.	1,400
262	Latex Wastes	Cleanup Water, Paint, Latex and Acrylic Resins	9,600
263	Other Polymeric Wastes	Kettle Bottoms, Thermoplastic Resins	1,400
264	Thermoset Wastes	Urea-Formaldehyde and Thermoset Wastes	1,400
28 OILY WASTES			
281	Waste Oil and Mixed Oil	Used Automotive Oil, Hydraulic Oil, Cutting Oil - May Contain Solvents or Metals	46,600
282	Oily Tank Bottoms	Crude Oil or Sludge from Storage	29,800
283	Oily Mud, Sediment and Water	Crude Oil Tanker Cleaning	69,000
284	Oily Acidic Solids	Solids from Emulsion Breaking and Re-Refining	10,400
285	Oily Alkaline Solids	Refining Solids	6,900
286	Oil/Water Separator Sludge	Oil Cooled Heavy Inorganics	5,000
288	Oily Wastes with Heavy Metal Contaminants	Steel Rolling Mill Sludges and Mill Scale	169,200
289	Oily Wastes with Water	Emulsions, Cleanup Water from Garages, Cooling Waters	100
41 RELATIVELY INERT SLUDGES			
416	Ink Sludge	Sludge Could Contain Solvents and Lead, Cesium, Chromium	4,100
417	Alum and Gypsum Sludges	Waste Water Phosphate Removal Sludge	1,100

APPENDIX A (CONTINUED)

CONSTITUENTS OF SPECIAL WASTE

UCD WASTE *	DESCRIPTION	TYPICAL WASTES	Estimated Waste Quantity (tonnes)
43 METAL SLUDGES			
431	Heavy Metal Sludge	Similar to that in 111, 113, 121, 123, 132, 133, 141	43,800
433	Other Metal Sludges	Ferric Chloride, Aluminum Oxide, etc.	9,200
44 - 45 OTHER SLUDGES			
441	Lime Sludges	From Treatment of Acids and Similar to 431 and Derived from 111, 113, 121, 123, 131 132, 133, 141	51,700
443	Sulfur Sludge	Desulfurization of Flue Gas Non-reactive but Very Low Bearing Strength	1,500
444	Cyanide Bearing Sludge	Pot Liners from Aluminum Reduction and Scrubber Sludge from Blast Furnace	27,400
445	Plating or Metal Finishing Sludge	Derived Mostly from 131, 132 133	6,600
446	Degreasing Sludge	Grease and Oily Soil Containing Trichloroethane (TCE)	28,500
447	Tetraethyl Lead Sludge	Tank Bottoms	< 100
454	Paint Sludge	Drum Bottoms, Spills, Cleanup, etc.	30,600
455	Paint Sludge Without Heavy Metals	Mostly Latex,	7,600
50 - 53 MISCELLANEOUS			
509	Gas Cylinders or Containers	Oxygen Cylinders - Empty	100

APPENDIX A (CONTINUED)

CONSTITUENTS OF SPECIAL WASTE

UCD WASTE *	DESCRIPTION	TYPICAL WASTES	Estimated Waste Quantity (tonnes)
512	Spill Cleanup	Oil/Soil Mixture	3,100
513	Laboratory Waste Chemicals	Partially Full Small Containers	1,200
518	Dust Collector Wastes	Dry Lime from Dust Control Baghouse	55,500
521	Spent Cartridge Filters	Air Cleaning Filters on Ventilation System	100
523	Tank Bottom Sediments		3,500
528	Pathogenic Wastes	Used Bandages, Dressings	2,000
531	Contaminated Rags	Cleanup Materials	300
532	Equipment and/or Containers Contaminated with Pesticides	Empty Pesticide Cans	1,800
			1,490,300

APPENDIX B

UCD WASTE CLASSIFICATIONS EXCLUDED FROM SPECIAL WASTE
(Deemed to be outside OWMC Mandate and hence quantities not calculated)

UCD NUMBER	WASTE CATEGORY	DESCRIPTION
144	Other aqueous solutions	Aqueous solutions (14) other than 141, 142, 143, 145, 146 or 147.
161	Asbestos-containing wastes	
162	Aluminum or tin wastes	
231	Organic solids with halogens	Polyvinyl
232	Organic solids without halogens	Polyethylene
253	Detergent and soap	Liquid, aqueous waste solutions and organic solids from production or cleaning operations.
255	Unspecified organic wastes	Organics not listed in other categories.
271	Sewage sludge	
272	Other Biological Wastes	Including animal fat, molasses wastes and dough.
412	Filter cake	Contaminated filter material, e.g., diatomaceous earth.
413	Gas scrubber sludge	From gas cleaning operations.
442	Phosphate sludge	
453	Paper sludge/pulp	Paper and cardboard manufacture source.
456	Other waste treatment sludge	Sludges not otherwise identified due to lack of composition data.
457	Sludges with organic residues	Includes some halogenated components.
510	Flue-gas scrubber liquid.	
511	Rinse water and waste water	Contains small units of oil, solvent, metals and/or mud; also bilge water.

APPENDIX B (CONTINUED)

UCD WASTE CLASSIFICATIONS EXCLUDED FROM SPECIAL WASTE
(Deemed to be outside OWMC Mandate and hence quantities not calculated)

UCD NUMBER	WASTE CATEGORY	DESCRIPTION
514	Contaminated oil and sand.	
515	Drilling mud.	
519	Fly ash and retort ash.	Combustion-generated particulates mineral matter plus some carbon.
524	Chemical toilet wastes.	
525	Metal dust and machining wastes.	Primarily ferrous and aluminum-based alloys.
526	Cannery wastes.	
527	Mud/sediment and water.	
530	Contaminated pallets.	
533	Contaminated equipment and containers.	Contaminants not stated.
535	Totally unspecified wasted	Used only for California manifest purposes.

Note: These classifications, along with those in Appendix A, constitute the complete UCD classification system.

APPENDIX C

PHASE 2 PUBLIC CONSULTATION MEETINGS

Provincial Network Meetings:

Industry Group Representatives Meeting
Four Seasons Hotel
Toronto, Ontario
12:00 p.m. - September 21, 1982

Canadian Steel Environment Association
Ontario Trucking Association
Canadian Manufacturers' Association
Petroleum Association for Conservation of the Canadian Environment
Canadian Chemical Producers' Association

Environmental Liaison Group Meeting
McMaster University
Hamilton, Ontario
7:30 p.m. - September 23, 1982

Pollution Probe
Ontario Public Interest Research Group
Waterloo Public Interest Research Group
Clear Hamilton of Pollution
Haldimand-Norfolk Organization for a Pure Environment
Concerned Citizens of Whitchurch-Stouffville
Canadians for a Clean Environment

Ontario Federation of Agriculture - Environment Committee Meeting
Suite 500 - 491 Eglinton Avenue West
Toronto, Ontario
10:00 a.m. - September 28, 1982

Ontario Federation of Agriculture - Environment Committee
Ontario Federation of Agriculture Staff

APPENDIX C (Continued)

Association of Municipalities of Ontario
Suite 902 - 100 University Avenue
Toronto, Ontario
10:00 a.m. - October 1, 1982

City of Chatham
New Liskeard
AMO Staff
Stirling
Town of Ajax
City of Windsor
Victoria County
R.R.#1 Elgin
Regional Municipality of Hamilton/Wentworth
Regional Municipality of Sudbury
Regional Municipality of Haldimand/Norfolk
City of Cambridge
Niagara-on-the-Lake
City of Sault Ste. Marie
Huron County

Regional Meetings:

Citizens Rebelling Against Waste Meeting
North Hall - Chatham Holiday Inn
25 Keil Drive North
Chatham, Ontario
9:30 a.m. - September 29, 1982

Citizens Rebelling Against Waste
M.P.P. Kent-Elgin

Township of Tilbury West Meeting
North Hall - Chatham Holiday Inn
25 Keil Drive North
Chatham, Ontario
11:00 a.m. - September 29, 1982

Council, Tilbury West
Comber Chamber of Commerce
Deputy Reeve, Tilbury West

APPENDIX C (Continued)

County of Essex Meeting
North Hall - Chatham Holiday Inn
25 Keil Drive North
Chatham, Ontario
1:00 p.m. - September 29, 1982

Tilbury North
Township of Anderdon
Gosfield Township North
County of Essex
Township of Colchester North
Town of Tecumseh
Township of Maidstone
Corp. Town of Leamington
Township of Tilbury West
Essex Regional Conservation Authority.

County of Kent Meeting
North Hall - Chatham Holiday Inn
25 Keil Drive North
Chatham, Ontario
3:00 p.m. - September 29, 1982

Township of Harwich
Chatham Township
Romney Township
Township of Camden
Township of Blenheim
County of Kent
County of Kent CAO
Township of Dover
Township of Tilbury East
Orford Township
M.P.P. Kent-Elgin
Warden, Kent County
Town of Blenheim
Raleigh Township Reserve
Raleigh Township

Lambton Industrial Society Meeting
Bluewater Room - Sarnia Holiday Inn
Hwy #40 - Point Edward
Sarnia, Ontario
1:00 p.m. - October 5, 1982

APPENDIX C (Continued)

County of Lambton (Planning Department)
Bluewater Room - Sarnia Holiday Inn
Hwy #40 - Point Edward
Sarnia, Ontario
3:00 p.m. - October 5, 1982

Lambton Federation of Agriculture
Bluewater Room - Sarnia Holiday Inn
Hwy #40 - Point Edward
Sarnia, Ontario
7:00 p.m. - October 5, 1982

Lambton Anti-Pollution Association
Bluewater Room - Sarnia Holiday Inn
Hwy #40 - Point Edward
Sarnia, Ontario
8:30 p.m. - October 5, 1982

Peter Shaw, Energy Education Consultant
London City Centre - Tower Holiday Inn
300 King Street
London, Ontario
10:30 a.m. - October 7, 1982

Provincial Council of Women of Ontario
London City Centre - Tower Holiday Inn
300 King Street
London, Ontario
11:00 a.m. - October 7, 1982

Huron County Council
London City Centre - Tower Holiday Inn
300 King Street
London, Ontario
1:00 p.m. - October 7, 1982

APPENDIX C (Continued)

City of London Engineers and
Citizens Coalition to Maintain the Environment
London City Centre - Tower Holiday Inn
300 King Street
London, Ontario
2:30 p.m. - October 7, 1982

Huron County Federation of Agriculture
London City Centre - Tower Holiday Inn
300 King Street
London, Ontario
4:00 p.m. - October 7, 1982

Regional Municipality of Peel - Waste Management Staff
Toronto Metropolitan Library
789 Yonge Street
Toronto, Ontario
10:30 a.m. - October 21, 1982

Don Cousens, M.P.P. York Centre
Toronto Metropolitan Library
789 Yonge Street
Toronto, Ontario
2:00 p.m. - October 21, 1982

General Motors of Canada
Toronto Metropolitan Library
789 Yonge Street
Toronto, Ontario
2:30 p.m. - October 21, 1982

Victoria County Council Representatives
Toronto Metropolitan Library
789 Yonge Street
Toronto, Ontario
3:30 p.m. - October 21, 1982

APPENDIX C (Continued)

Supplemental Meetings:

Decisions on the Great Lakes Seminar
Brock University
St. Catharines, Ontario
Wednesday - October 6, 1982

City of Cornwall
Environmental Control Committee
Cornwall, Ontario
Wednesday, November 17, 1982

Kent County Federation of Agriculture
Chatham, Ontario
Wednesday, December 8, 1982

APPENDIX D

WRITTEN SUBMISSIONS ON PHASE 2

1. Great Lakes Decisions, Session III
   Brock University, St. Catharines, Ontario
   Case Study - Ontario Waste Management Corporation
   Pat Hayes
   October 6, 1982

2. Great Lakes Decisions, Session III
   Brock University, St. Catharines, Ontario
   Waste Management -- Transportation
   Ann Pinnegar
   October 6, 1982

3. Statement to Ontario Waste Management Corporation
   The Provincial Council of Women of Ontario
   October 7, 1982

4. Phase 1 Report and Recommendations
   The Canadian Manufacturers' Association
   October 21, 1982

5. Response to "Facilities Development Process"
   Don Cousens, M.P.P. York Centre
   October 21, 1982

APPENDIX E

The Phase 2 Report will be placed on deposit in the following locations:

A) Government Libraries

1. Ministry of the Environment
   Departmental Library
   135 St. Clair Avenue West
   Toronto, Ontario
   M4V 1P5

2. Environment Canada
   Department Library
   Place Vincent Massey
   Hull, Quebec
   K1A 1C7

B) Ontario University Libraries

1. Brock University
   University Library
   St. Catharines, Ontario
   L2S 3A1

2. Carleton University
   University Library
   Ottawa, Ontario
   K1S 5B6

3. University of Guelph
   University Library
   Guelph, Ontario
   N1G 2W1

4. Lakehead University
   University Library
   Thunder Bay, Ontario
   P7B 5E1

5. Laurentian University of Sudbury
   University Library
   Sudbury, Ontario
   P3E 2C6

APPENDIX E (Continued)

6. McMaster University
University Library
Hamilton, Ontario
L8S 4L8

7. University of Ottawa
University Library
Ottawa, Ontario
K1N 6N5

8. Queen's University
University Library
Kingston, Ontario
K7L 3N6

9 University of Toronto
University Library
Toronto, Ontario
M5J 2H7

10. Trent University
University Library
Peterborough, Ontario
K9J 7B8

11. University of Waterloo
University Library
Waterloo, Ontario
N2L 3G1

12. University of Western Ontario
University Library
London, Ontario
N6A 3K7

13. Wilfrid Laurier University
University Library
Waterloo, Ontario
N2L 3C5

14. University of Windsor
University Library
Windsor, Ontario
N9B 3P4

15. York University
University Library
Toronto, Ontario
M3J 1P3

APPENDIX E (Continued)

C) Regional Libraries

1. Algonquin Regional Library System
29 Mary Street
Parry Sound, Ontario
P2A 1E3

2. Central Ontario Regional Library System
129 Church Street South
Richmond Hill, Ontario
L4C 1W4

3. Chatham Library
120 Queen Street
Chatham, Ontario
N7M 2G6

4. Eastern Ontario Regional Library System
200 Cooper Street, Suite 6
Ottawa, Ontario
K2P 0G1

5. Georgian Bay Regional Library System
30 Morrow Road
Barrie, Ontario
L4N 3V8

6. Lake Erie Regional Library System
380 Saskatoon Street
London, Ontario
N5W 4R3

7. Lake Ontario Regional Library System
88 Wright Crescent
Kingston, Ontario
K7L 4T9

8. Metro Toronto Library Board
789 Yonge Street
Toronto, Ontario
M4W 2G8

9. Midwestern Regional Library System
637 Victoria Street North
Kitchener, Ontario
N2H 5G4

10. Niagara Regional Library System
15 Lloyd Street
St. Catharines, Ontario
L2S 2N7

APPENDIX E (Continued)

11. North Central Regional Library System
334 Regent Street South
Sudbury, Ontario
P3C 4E2

12. Northeastern Regional Library System
6 Al Wende Avenue
Kirkland Lake, Ontario
P2N 3G9

13. Northwestern Regional Library System
910 Victoria Avenue
Thunder Bay, Ontario
P7C 1B4

14. Sarnia Library
124 Christina Street South
Sarnia, Ontario
N7T 2M6

15. South Central Regional Library System
220 Dundurn Street South
Hamilton, Ontario
L8P 4K7

16. Southwestern Regional Library System
660 Ouellette Avenue
Suite 216
Windsor, Ontario
N9A 1C1

17. Waterloo Regional Library System
Marsland Centre
7th Floor, 20 Erb Street West
Waterloo, Ontario
N2J 4G7

THE SEARCH PROCESS

REVIEW PROCESS

STEP 1

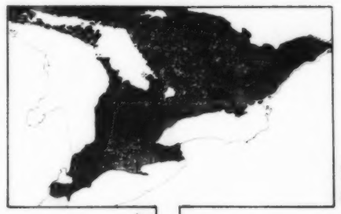
Narrowing the search to a geographic region

★ **TRANSPORTATION FACTOR**

- Minimize the distances between main treatment facilities and majority of waste generators

★ **ENVIRONMENTAL FACTOR**

- All treatments should be located on Zones 1 or 2 (see Figure 1)



Southern Ontario

Geographic Region (Golden Horseshoe)

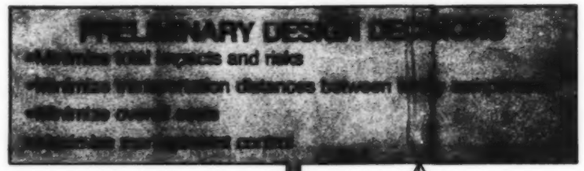
FACILITIES DEVELOPMENT PLAN

SEPTEMBER 1982

JANUARY 1983

STEP 1 FACTORS REVIEW (IF NECESSARY)

PREFERRED TREATMENT SYSTEM SELECTION



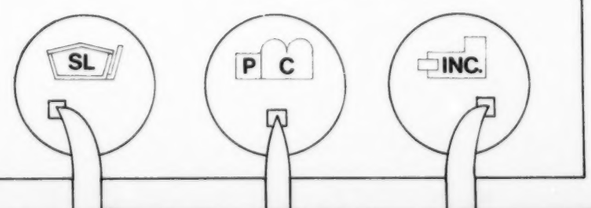
STEP 2

Candidate regions to candidate areas suitable for each treatment

ENVIRONMENTAL FACTORS			
Treatment	Hydrogeological	Sewage treatment	Air shed
Incinerator	Deep clay Zone 1 or 2	Required	Maximum dispersal
Physical/Chemical treatment	Deep clay Zone 1 or 2	Required	Not required
Secure landfill	Deep clay Zone 1 or 2	Not required	Not required

STEP 2 FACTORS REVIEW (IF NECESSARY)

CANDIDATE AREAS (No predetermined number) (Up to 40 km in diameter)



treatment	Zone 1 or 2	Required	required
Secure landfill	Deep clay Zone 1 or 2	Not required	Not required

STEP 2 FACTORS REVIEW (IF NECESSARY)

FIVE POSSIBLE COMBINATIONS OF TREATMENT AND DISPOSAL SYSTEMS

SL P C INC.	Integrated
SL P C INC.	Dispersed
SL P C INC.	Partially Dispersed
SL P C INC.	Partially Dispersed
P C SL INC.	Partially Dispersed

CANDIDATE AREAS (No predetermined number) (Up to 40 km in diameter)

SL P C INC.

STEP 3

Identifying candidate site(s) within candidate areas

LAND USE FACTORS (Ranked)
1. Industrially designated land
2. Publicly held land
3. Privately owned land

STEP 3 FACTORS REVIEW (IF NECESSARY)

PREFERRED COMBINATION OF SYSTEMS

CANDIDATE SITES WITHIN CANDIDATE AREAS (No predetermined number)

SL P C INC.

STEP 4

Evaluate candidate sites

Select preferred sites(s)

★ **ENVIRONMENTAL FACTORS**
- No perennial streams or floodlands
- No habitats of rare or endangered species
- No sites of high archaeological or historic interest
- Close to existing or planned sewage treatment system
- No adverse local air dispersal effects
- Soils must provide natural containment
- No slopes in excess of 20°

★ **TRANSPORTATION FACTORS**
- Near major provincial highways
- Access routes having minimal residential use
- Minimal need for bridges, culverts, and engineering to upgrade access

★ **LAND USE FACTORS**
- Respect for present land use/activities.
- Minimum number of landowners
- Respect for present land use plans and zoning.

STEP 4 FACTORS REVIEW

SELECTED SITE(S) (No predetermined number)

SL

P C

INC.

CANDIDATE SITES WITHIN CANDIDATE AREAS (No predetermined number)

PREFERRED COMBINATION OF SYSTEMS

STEP 4

Evaluate candidate sites

Select preferred sites(s)

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★ **LAND USE FACTORS**
- Respect for present land use/activities.
- Minimum number of landowners
- Respect for present land use plans and zoning.

STEP 4 FACTORS REVIEW

SELECTED SITE(S) (No predetermined number)

SL

P C

INC.

STEP 5

Evaluate selected site(s) in detail

- Site(s) examined physically utilizing guidelines for environmental impact assessment

IF SITE(S) INADEQUATE, REVIEW FACTORS RANKING STARTING AT STEP 4

TO HEARING(S)

★ Public input will be necessary before factors ranked.